

Zostera japonica [简体中文](#) [正體中文](#)

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Najadales	Zosteraceae

Common name dwarf eelgrass (English)

Synonym *Zostera americana* , den Hartog
Zostera nana , Roth

Similar species *Zostera marina*

Summary *Zostera japonica* is one of approximately 60 seagrasses, or marine angiosperm species. The only documented invasive seagrass, it has invaded Pacific coast estuaries in Canada and the United States. *Zostera japonica* alters physical habitat structure as well as the richness and densities of resident fauna



[view this species on IUCN Red List](#)

Species Description

Zostera japonica is a submerged hydrophyte of intertidal marine and estuarine habitats. It is a monoecious, predominantly annual, glabrous herb. The rhizomes creep or ascend, and produce roots and shoots at the nodes. Internodes can be variable in length but are more or less elongate. The stems are flattened and branched, and the branches are partly sterile and abbreviated. The roots are mostly un-branched and arranged in two groups with two or more roots in each group. The leaves are simple and distichously arranged. Leaves are typically flat, linear, entire, and exhibit 3 parallel veins. The inflorescence is a flattened spadix enclosed by a spathe. The flowers are small, hydrophilous, and unisexual and lack a perianth. Rhizomes are from 0.5-1.5mm in diameter. Internodes are from 1-3cm long. Leaves can reach lengths of up to 30cm, and widths of 0.8-1.3mm. The leaf sheath can be up to 6cm in length and membranous (Shin and Choi, 1997). NOAA (2004) reports that, "when this species grows on tidal flats, the leaves are short and narrow, but when growing completely submerged in lagoons, the leaves are longer and wider."

Lifecycle Stages

Harrison and Bigley (1982) report that, "The establishment of new populations of *Zostera japonica* occurs mainly by seed germination although the chance of a seedling surviving its 1st summer is small. Once established, patches expand in area exponentially in spring and may help to stabilize the sediment."

Uses

Animals associated with *Zostera japonica* beds can benefit from available food resources, i.e. primary production, detritus, and epiphytes. The above- and below-ground biomass of *Z. japonica* also provide refuge from predators and buffer environmental stresses, such as tidal energy (Lee *et al.* 2001).

Habitat Description

Shin and Choi (1997) state that, "*Zostera japonica* can be found in broadly sheltered bays on sandy or muddy coasts at depths of up to 1-3 metres. It is also found along cool to subtropical seacoast in its native range." NOAA (2004) reports that, "*Z. japonica* is commonly found growing on sheltered tidal flats, but can also be found in brackish (estuarine) coastal lagoons."



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Zostera japonica*

Reproduction

Zostera japonica is a monoecious species that reproduces both vegetatively (clonally) and sexually (via seed production). New sites are primarily colonized by seeds.

General Impacts

Zostera japonica was first documented on the North American Pacific Coast in the late 1950s, and has since colonised historically unvegetated tidal flats and significantly altered physical habitat structure (Baldwin and Lovvorn 1994). Durance (2002) concluded that *Z. japonica* has contributed to declines in shorebird foraging habitats by causing changes in benthic invertebrate community structure. Posey (1988) noted that the introduction of *Z. japonica* "... has changed the physical habitat as well as the richness and densities of resident fauna." Larned (2003) demonstrated that *Z. japonica* invasions alter water column-benthos nutrient fluxes.

Management Info

Chemical: Entrix (2003) reported that, "Both imazapyr and glyphosate killed off the eelgrass canopy of both *Zostera japonica* and *Z. marina*. These species were killed if herbicide was applied on dry specimens at low tide, although the imazapyr was more toxic. If applied with a film of water overlying the bed, then no effect was recorded. Within 12 months post-treatment, all impacted eelgrass beds had recovered."

Physical: During April 2003 in Humboldt Bay (California, USA) University of California (UC) Extension workers began removing *Z. Japonica* with the help of volunteers. They attempted to install sections of plastic over *Z. Japonica* to kill it by shading, but found that the bay's strong tides pulled the sheets away (Rushton, 2005). The author reported that digging up *Z. Japonica* resulted in rapid revegetation by native eelgrass *Z. Marina*.

Pathway

The fact that several areas where *Zostera japonica* is abundant are sites of intensive oyster cultivation suggests that the plant was introduced as a contaminant (probably seeds) in shipments of Japanese oysters in the first few decades of the 20th

Principal source: Shin and Choi, 1997. Taxonomy and distribution of *Zostera* (Zosteraceae) in eastern Asia, with special reference to Korea

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ALIEN RANGE

[3] CANADA

[17] UNITED STATES

BIBLIOGRAPHY

22 references found for *Zostera japonica*

Management information

Baldwin, J. R., and J. R. Lovvorn. 1994. Expansion of seagrass habitat by the exotic *Zostera japonica*, and its use by dabbling ducks and brant in Boundary Bay, British Columbia. *Marine Ecology-Progress Series*. 103(1-2). 1994. 119-127.

Elsa, L., S. Carlisle, and T. Klinger. UNDATED. New Directions for Managing Washington State Seagrass Resources. University of Washington.

Entrix. 2003. Ecological Risk Assessment of the Proposed Use of the Herbicide Imazapyr to Control Invasive Cordgrass (*Spartina* spp.) in Estuarine Habitat Of Washington State. Washington State Department of Agriculture.

Fong, T. C. W. 1999. Conservation and management of Hong Kong seagrasses. *Asian-Marine-Biology*. 1999; 16: 109-121.

Hughes, A. R., K. J. Bando, L. F. Rodriguez, and S. L. Williams. 2004. Relative effects of grazers and nutrients on seagrasses: a meta-analysis approach. *Marine Ecology Progress Series* 282:87-99.

Larned, S. T. 2003. Effects of the invasive, nonindigenous seagrass *Zostera japonica* on nutrient fluxes between the water column and benthos in a NE Pacific estuary. *Marine Ecology-Progress Series* 254:69-80.

Global Invasive Species Database (GISD) 2024. Species profile *Zostera japonica*. Available from: <https://iucngisd.org/gisd/species.php?sc=859> [Accessed 30 November 2024]

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FULL ACCOUNT FOR: *Zostera japonica*

- Lee, S. Y., C.W. Fong, and R.S.S. Wub. 2001. The effects of seagrass *Zostera japonica* canopy structure on associated fauna: a study using artificial seagrass units and sampling of natural beds. *Journal of Experimental Marine Biology and Ecology* 259:23-50
- Posey, M. H. 1988. Community Changes Associated with the Spread of an Introduced Seagrass, *Zostera japonica*. *Ecology*. 69(4). 1988. 974-983.
- Rushton, N. 2005. Conservationists attempt to rid bay of nonnative plants. *The Eureka Reporter*.

General information

- Bando, K. J. In press. The roles of competition and disturbance in a marine invasion. *Biological Invasions*.
- den Hartog, C. 1970. *The Sea-grasses of the World*. North Holland Publishing Company, Amsterdam.
- Durance, C. 2002. The Search for Introduced Eelgrass - *Zostera japonica*. *Eelgrass Watchers Issue No. 1*.
- Fong, T. C. W. 1998. Distribution of Hong Kong seagrasses. *Porcupine!* #18 Dec 1998.
- Harrison, P. G., and R. E. Bigley. 1982. The Recent Introduction of the Seagrass *Zostera japonica* to the Pacific Coast of North America. *Canadian Journal of Fisheries & Aquatic Sciences*. 39(12). 1982. 1642-1648.
- [ITIS \(Integrated Taxonomic Information System\), 2005. Online Database *Zostera japonica*](#)
- Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals. Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=505809 [Accessed March 2005]
- [Kaldy, J. Undated. Invaders that could be expanding their ranges in Oregon estuaries.](#)
- Summary:** Available from: <http://science.oregonstate.edu/~yamadas/second.html> [Accessed 12 April 2005]
- [NOAA \(National Oceanic and Atmospheric Administration\). 2004. Touch Tank: Dwarf eelgrass \(*Zostera japonica*\). Benthic Habitat Mapping.](#)
- Summary:** Available from: <http://www.csc.noaa.gov/benthic/resources/species/species3.htm> [Accessed 12 April 2005]
- Riggs, S. Undated. Non-native Species at the Padilla Bay NERR. Stewardship Coordinator, Padilla Bay NERR.
- Sand-Jensen, K., N. P. Revsbech, and B. B. Jorgensen. 1985. Microprofiles of oxygen in epiphyte communities on submerged macrophytes. *Marine Biology* 89:55-62.
- Shin, H., and H. K. Choi. 1998. Taxonomy and distribution of *Zostera* (Zosteraceae) in eastern Asia, with special reference to Korea. *Aquatic-Botany*. 1998; 60(1): 49-66.
- Washington State Exotics Expedition. 2000. Rapid Survey of Exotic Species in the Shallow Waters of Elliott Bay, Totten and Eld Inlets, and Willapa Bay. The Nearshore Habitat Program Washington State Department of Natural Resources.
- Yuen, P. Y., C. F. Sun, and Y. L. Ho. 2002. Taxonomy and distribution of seagrasses in Taiwan. *Taiwania*. 2002; 47(1): 54-61.